

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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FINLANDE

CONFIRMATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL PRELIMINARY
EXAMINING AUTHORITY

(PCT Rule 66)

Date of mailing
(day/month/year)

13.04.2006

Applicant's or agent's file reference
LIC 8B PCT

REPLY DUE

from the above date of mailing

within 2 month(s)

International application No.
PCT/FI2004/000683

International filing date (day/month/year)
15.11.2004

Priority date (day/month/year)
14.11.2003

International Patent Classification (IPC) or both national classification and IPC
INV. H01J49/00

Applicant
LICENTIA OY et al.

1. ☒ The written opinion established by the International Searching Authority:

☐ is ☒ is not

considered to be a written opinion of the International Preliminary Examining Authority.

2. This first opinion contains indications relating to the following items:

☒ Box No. I Basis of the opinion

☐ Box No. II Priority

☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☒ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(e).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6.

For an additional opportunity to submit amendments, see Rule 66.4.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary report on patentability (Chapter II of the PCT) must be established according to Rule 69.2 is: 14.03.2006

Name and mailing address of the international preliminary examining authority:



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**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY**

AP9 Rec'd PCT/PTO 12 MAY 2006
International application No.
PCT/FI2004/000683

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into ,
which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the elements of the international application, this opinion has been established on the basis of
(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

Description, Pages

1-17 as published

Claims, Numbers

1-32 as published

Drawings, Sheets

1/5-5/5 as published

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY**

International application No.
PCT/FI2004/000683

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application
- ☒ claims Nos. 10-11, 14-16, 27-29

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):
- ☒ no international search opinion has been established for the said claims Nos. 10-11, 14-16, 27-29
- ☐ a meaningful opinion could not be formed without sequence listing; the applicant did not, within the prescribed time limit:
 - ☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.
 - ☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.
 - ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13*ter*.1(a) or (b) and 13*ter*.2.
- ☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions, and such tables were not available to the International Preliminary Examining Authority in a form and manner acceptable to it.
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☒ See supplemental sheet for further details

**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY**

International application No.
PCT/FI2004/000683

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees the applicant has, within the applicable time limit:
- ☐ restricted the claims
 - ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☒ neither restricted nor paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:
3. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☐ all parts
 - ☒ the parts relating to claims Nos. 1-9, 12-13, 17-26, 30-32

Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1, 2, 6, 7, 8, 13, 17, 19, 21, 24, 30
Inventive step (IS)	Claims	1-3, 5-9, 12, 13, 17-19, 21-26, 30-32
Industrial applicability (IA)	Claims	

2. Citations and explanations:

see separate sheet

**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY
(SEPARATE SHEET)**

International application No.

PCT/FI2004/000683

Re Items III and IV

With regard to the non-unity reasoning given in the WOISA it is noted that the claims 27 and 28 were included by mistake in both invention 1 and invention 3. In view of the subject matter of claims 27 and 28 it is considered that said claims actually belong to invention 3 and not to invention 1 and their subject matter is not covered by the documents cited in the search report. This mistake has been corrected in the present opinion.

Except for the above remark the reasoning regarding non-unity given in the WOISA remains valid.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The following reasoned statement is made only with regard to claims 1-9, 12-13, 17-26 and 30-32 considered to belong to invention 1 in the reasoning regarding non-unity as set out in the WOISA and the present opinion.

Reference is made to the following documents:

D1: US 6 610 978 B
D2: EP 0 452 930 A
D4: WO 00 41214 A

Upon further study of the documents mentioned in the search report the document D1 is not considered to be particularly relevant as it does not mention or suggest the use of corona discharge or APCI ionization. However, the document D4 is considered to be relevant prior art for the reasons laid out below.

1 Independent claim 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

The document D4 discloses (the references in parentheses applying to this

document):

A method of examining a sample by means of mass spectrometry (p. 20, l. 29 - p. 21, l. 14), according to which method

- the solution comprising the sample to be examined is vaporised in a vaporiser (fig. 1; 10,14);
- the vaporised sample solution is sprayed, using a gas flow, into a corona discharge zone (p. 20, l. 29 - p. 21, l. 14; corona discharge is the mechanism underlying the APCI method), where the sample to be examined is ionised using a corona discharge to generate gas phase ions; and
- the ions are separated (p. 20, l. 29 - p. 21, l. 14; implicit in mass spectrometry) and directed to a detector (p. 20, l. 29 - p. 21, l. 14; implicit),
- using a vaporiser which is fabricated as a micromechanical structure (fig. 1; 10, 14).

A similar argument can be based on document D2 (see fig. 1 and col. 4, l. 22-35).

2 Independent claim 17

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 is not new in the sense of Article 33(2) PCT.

The document D4 discloses (the references in parentheses applying to this document):

An apparatus for examining a sample by means of mass spectrometry (p. 20, l. 29 - p. 21, l. 14), comprising

- a vaporiser (fig. 1; 10,14) for vaporising the solution comprising the sample to be examined,
- a corona discharge device, connected to the vaporiser (p. 20, l. 29 - p. 21, l. 14; corona discharge is the mechanism underlying the APCI method), in which the sample to be examined is ionised according to the Atmospheric Pressure Chemical Ionization (p. 20, l. 29 - p. 21, l. 14) method, to generate charged particles,
- a detector (implicit), connected to the corona discharge device, to detect charged particles, and
- means for directing the charged particles (p. 20, l. 29 - p. 21, l. 14; implicit in

mass spectrometry), using electric and/or magnetic fields, from the corona discharge device to a detector,

- the vaporiser is fabricated as a micromechanical structure (fig. 1; 10, 14).

A similar argument can be based on document D2 (see fig. 1 and col. 4, l. 22-35) as it is generally known to the person skilled in the art that the APCI method is closely related to the corona discharge ionization and is an equivalent to the corona discharge of document D2 which can be interchanged with that ionization method where circumstances make it desirable.

3 Independent claim 30

The reasoning against claim 17 applies, mutatis mutandis, to the subject-matter of independent claim 30, which therefore is also considered not novel.

4 Dependent claims 2, 3, 5-9, 12, 13, 18, 19, 21-26, 31, 32

Dependent claim 2 does not contain any features which, in combination with the features of claim 1 to which it refers, meet the requirements of the PCT in respect of novelty (see document D2 fig. 1; 7).

Dependent claims 6, 7, 8, 13, 19, 21 and 24 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (see document D4, fig. 1; p. 20, l. 29 - p. 21, l. 14):

Dependent claims 3, 9, 12, 25, 26, 31 and 32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step over the disclosure of document D4 as the features are considered to be conventional in the art.

Dependent claims 5, 18, 22 and 23 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step over the disclosure of document D4 in combination with the corona discharge device with an additional heater as disclosed in document D2 (see fig. 1; 7).

5 Dependent claims 4 and 20

The combination of the features of dependent claims 4, 20 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

The difference between the subject matter of claims 4 and 20 and the available prior art is the integration of the corona discharge zone into the micromechanical structure.

This solves the problem of allowing a more compact construction of the device.

The integration of a corona discharge zone into a micromechanical structure is neither known nor suggested by the prior art, which only suggests to use an external corona discharge needle (see e. g. document D2, fig. 1).